

The current technology involved with overlaying any type of digital subscriber loop (xDSL) service with plain old telephone service (POTS) makes use of two separate

transformers, one for POTS and another for xDSL. This invention provides a transformer which combines the POTS transformer and the xDSL transformer into one transformer. This considerably reduces the weight volume and cost of the overlaid POTS and xDSL circuits. In combining the two transformers the magnetic coupling between any one of the windings used for POTS and any one of those used for xDSL must remain weak despite their close proximity. In addition, any two windings of the same type of service, either POTS or xDSL, must remain strongly coupled. This is achieved by choosing a special geometric form for the core and choosing strategic locations for the windings. A portion of the core is dedicated to serve as a shunt for each component of the magnetic field produced by the windings. Strongly coupled windings are wound around a same portion of the core whereas weakly coupled windings are wound around different core portions which are separated by the shunt.